

## **Amendments to the Drawings:**

The attached sheet of drawings includes changes to FIG. 1. This sheet, which include(s) FIG. 1 replaces the original sheet including FIG. 1.

Attachment: Replacement Sheet

Annotated Sheet Showing Changes

## Remarks

Reconsideration of the rejections set forth in the Office Action dated December 28, 2005 is respectfully requested. Claims 1, 3-10, and 12-22 have been rejected. Claims 23 and 24 have been added. As such, claims 1, 3-10, and 12-24 are currently pending.

New claim 23 recites that autonomously switching from a non-operational active element to an associated redundant element includes switching from an active control unit to a redundant control unit. New claim 24 recites that autonomously switching from a non-operational active element to an associated redundant element includes switching from an active cross-connect unit to a redundant cross-connect unit. It is respectfully submitted that no new matter has been added with the addition of claims 23 and 24, and that the claims are fully supported by the Specification.

Claims 1, 3-6, 12-15, and 19-22 have been amended to recite “elements” instead of “cards.” It is respectfully submitted that no new matter has been added with the amendments, and that the amendments are fully supported by the Specification.

The Applicant notes that the Office Action dated December 28, 2005 is the **third non-final Office Action** for that instant application that has been issued by the Examiner since a Request for Continued Examination was filed on September 13, 2004.

It is noted that in his rejections of the independent claims in the Office Action dated December 28, 2005, the Examiner has included the words “as best understood.” The Applicant is puzzled as to why the Examiner is only now stating that claims are being rejected “as best understood,” as no amendments to the claims were made in the responses to the previous two non-final Office Actions for the instant application that have been received since a Request for Continued Examination was filed. Previously, the Examiner has not raised issues with regards to understanding the claims.

### Drawings

The Examiner has objected to the drawings because “the backplane forming a plurality of data buses, the data buses, and the communications links between the plurality of cards claimed in claims 1, 10, 19, 20, and 21 are not shown in any of the figures.” The Applicant respectfully disagrees with the Examiner, and traverse this objection. It is noted that FIG. 7 shows a backplane. FIG. 7 shows flexible cross-connect systems (identified as NE) such as flexible cross-connect system 10 of FIG. 1 (see, *e.g.*, page 16 of the Specification at lines 5-16) that are part of a network ring. Components of flexible cross-connect system 10 are shown in FIG. 1, as well as in FIGS. 2 and 3. It is noted that, for example, connections 150, 160 are links, while communications bus 360 is a bus. As such, it is respectfully submitted that the features of a backplane, data buses, and communication links are shown in the various figures. Hence, it is requested that the Examiner’s objections to the drawings as not showing the features of claims 1, 10, 19, 20, and 21 be withdrawn.

The Examiner has also objected to FIG. 1 for not showing “label 10.” The Examiner is thanked for bringing this inadvertent omission to the Applicant’s attention. Reference number “10” has been added to Fig. 1, as shown in the included drawing sheets. Therefore, it is believed that the objection to FIG. 1 for not including a reference sign mentioned in the description has been overcome.

### Rejections under 35 U.S.C. § 112

The Examiner has rejected claims 1, 10, 19, 20, and 21 under 35 U.S.C. § 112 for various reasons. The Applicant will address each rejection separately.

The Applicant questions why, as these claims have not been amended in either of the last two responses filed by the Applicant, the Examiner has not previously rejected these claims under 35 U.S.C. § 112.

### *Enablement*

The Examiner has rejected claims 1, 10, 19, 20, and 21 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The Examiner argues that the limitation of monitoring the operational status for each communication link between a plurality of cards is not supported in the Specification, and does not enable one skilled in the art to make or use the invention.

The Applicant quotes the following passage from MPEP 2164.05:

“In accordance with the principles of compact prosecution, **if an enablement rejection is appropriate, the first Office action on the merits should present the best case** with all the relevant reasons, issues, and evidence ... The principles of compact prosecution also dictate that if an enablement rejection is appropriate and the examiner recognizes limitations that would render the claims enables, the examiner should note such limitations to applicant as early in the prosecution possible.”  
[emphasis added]

The limitation that the Examiner believes is not enabling was included in the claims as originally filed. Hence, this enablement rejection is making its first appearance in the **sixth** overall Office Action on the merits, and the **third** non-final Office Action on the merits since a Request for Continued Examination was filed. This does not seem to be consistent with the principles of compact prosecution.

The Applicant believes that the enablement rejection is not appropriate. With all due respect to the Examiner, the Applicant respectfully disagrees with his rejection. As noted by the Examiner on page 4 of the Office Action dated December 28, 2005, an ELSM 820 monitors and maintains information about the state of each slot, card, and communications link in the system 10 (Specification, on page 17 at lines 30-32).

It is noted that the monitoring functionality is not limited to being associated with an ELSM. The Applicant has never made such an argument. However, the ELSM 820 is taught as

monitoring links and initiating proper action when a failure is detected. Further, it is respectfully submitted that one of skill in the art would understand how to monitor the operational status of communications links between a plurality of cards when given information that an ELSM 820 monitors and maintains information about the state of a communications link, and initiates proper action when a failure is detected on the communications link. As quoted in MPEP section 2164, “Detailed procedures for making and using the invention may not be necessary if the description of the invention itself is sufficient to permit those skilled in the art to make and use the invention....” The Applicant believes that the description of monitoring the operational status of communications links in the Specification is more than sufficient to permit those skilled in the art to make and use the invention. Therefore, the Applicant respectfully requests that the rejection of claims 1, 10, 19, 20, and 21 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement be withdrawn.

#### *Indefiniteness*

The Examiner has rejected claims 1, 10, 19, 20, and 21 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. The Examiner states that it is not clear whether a “plurality of cards” is the same as a “plurality of interface cards.” It is respectfully submitted that the plurality of cards is clearly recited, as for example in claim 1, as including a plurality of interface cards. Therefore, the plurality of cards is clearly not the same as a plurality of interface cards, as the plurality of cards includes the plurality of interface cards. It is believed that the recitation of “cards” and “interface cards” in the claims is clear. However, in a sincere effort to expedite prosecution, the Applicant has amended the claims to recite a “plurality of elements” rather than a “plurality of cards.” Accordingly, the rejection of claims 1, 10, 19, 20, and 21 under 35 U.S.C. § 112, second paragraph, as being indefinite is believed to be overcome.

The Examiner has also rejected claims 1, 10, 19, 20, and 21 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention because it is not clear which communication links are referred to in the phrase “communication links between the plurality of

cards.” On page 5 of the Office Action dated December 28, 2005, the Examiner states that “In Figure 1, there are links between the plurality of subsystems, not between cards, and only in the Data Plane”

It is respectfully submitted that connections and connectors, *e.g.*, connections 150 and connectors 150, are communication links. Whether communications links are “only in the Data Plane” (which the Applicant is neither confirming nor denying to be the case), is irrelevant to the claims. Further, it is noted that that subsystems are not taught as not being cards. As amended, the claims recite communication links between a plurality of elements and not cards. Communication links are clearly in existence between a plurality of elements. Therefore, it is respectfully requested that the Examiner withdraw his rejection of claims 1, 10, 19, 20, and 21 under 35 U.S.C. § 112, second paragraph, for not being clear as to which communication links are referred to in the phrase “communication links between the plurality of cards.”

#### Rejections under 35 U.S.C. § 103

The Examiner has rejected claims 1, 3, 6, 10, 12, 15, 20, 21, and 22 under 35 U.S.C. § 103(a) as being unpatentable over Cantwell et al. (U.S. Patent No. 6,370,55), hereinafter referred to as Cantwell, in view of Barker et al. (U.S. Patent No. 6,363,421), hereinafter referred to as Barker. The Examiner has rejected claims 7, 8, 16, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Cantwell in view of Barker, as applied to claims 1 and 3, and further in view of Fowler. (“TMN-Based Broadband ATM Network,” IEEE Communication Magazine, March 1995), hereinafter referred to as Fowler. The Examiner has rejected claims 4 and 13 under 35 U.S.C. § 103(a) as being unpatentable over Cantwell in view of Barker, as applied to claims 1 and 3, and further in view of Jun et al. (“Stand-by Loading Scheme: An Effective Software Retrofit Method for Switching System”), hereinafter referred to as Jun. The Examiner has rejected claims 5 and 14 under 35 U.S.C. § 103(a) as being unpatentable over Cantwell in view of Barker, as applied to claim 1, and further in view of Harris (U.S. Patent No. 5,771,274), hereinafter referred to as Harris. Claims 9 and 18 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Cantwell in view of Barker, as applied to claim 1, and further in view of

Badt, Jr. (U.S. Patent Pub. No. 2003/0133417), hereinafter referred to as Badt. Claim 19 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Cantwell in view of Read et al. (U.S. Patent No. 5,781,527), hereinafter referred to as Read, and Badt.

*1. Independent claims 1, 10, 20, and 21, and their respective dependents*

Independent claim 1 requires that a method for controlling the operation of a flexible cross-connect system includes monitoring the operational status of elements and communications links between the elements in the system, determining when the operational status of any of the elements or links between the elements indicates that the element or link between the elements is non-operational. The method also involves autonomously switching from the non-operational element or link between the elements to an associated redundant element or link between the elements, and determining when the non-operational active element or link between the elements requires maintenance. If it is determined that the non-operational active element or link between the elements requires maintenance, the method also includes reporting that maintenance is required.

The Examiner has argued that Cantwell in view of Barker teaches the limitations of claim 1. The Applicant respectfully disagrees with the Examiner, and submit that the cited art does not teach of or reasonably suggest the limitations of claim 1.

Claim 1 recites determining when a non-operational element or a non-operational communications link between a plurality of elements requires maintenance. The Examiner has argued on page 7 of the Office Action dated December 28, 2005 that Cantwell teaches this limitation. It is respectfully submitted that the passages cited by the Examiner only disclose that a spare card is provided in the event that maintenance is needed on a primary card (Cantwell, column 9 at lines 30-32 and column 6 at line 28), and that a circuit or a connection can remain in service while maintenance is performed on a network interface card (Cantwell, column 2 at lines 42-49). Cantwell fails to teach determining when a non-operational element or a non-operational communications link requires maintenance. At best, Cantwell discloses that maintenance may be

performed on a card. There is no teaching of determining **when** maintenance is required. Therefore, claim 1 is believed to be allowable over the cited art for at least this reason.

Claim 1 also recites autonomously switching from the non-operational element or link between the elements to an associated redundant element or link between the elements. The Examiner argues that Cantwell teaches of this limitation. The Examiner cites lines 41-46 of column 16 of Cantwell, as well as lines 45-48 of column 17 of Cantwell as teaching of this limitation. Lines 41-46 of column 16 of Cantwell read as follows:

“Plane selection is controlled by system administration, but automatic switching capability is supported by the network interface card 100 firmware in case the selected plane fails.”

Lines 45-48 of column 17 of Cantwell read as follows:

“Monitor and selection circuitry provides failure detection and timing plane switching capability.”

Cantwell appears to disclose, at best, that when one plane fails, an automatic switching capability allows another plane to be selected. A plane such as a matrix plane or a timing plane is not taught as being an element or a link included in a flexible cross-connect system. Further, there is no indication in Cantwell that one plane is redundant relative to the other plane. In fact, Cantwell appears to teach away from one plane being redundant, as Cantwell discloses at lines 39-42 of column 16 that data is accepted from both matrix planes, and that both planes are monitored for valid parity and path ID. Hence, both planes appear to be in use, and a switch occurs only when a plane selected for conversion into network signals fails. In other words, both planes are in use, and when one of the planes in use that converts a network signal fails, a switch is made to the other plane that is in use (Cantwell, column 16 at lines 42-46). As Cantwell teaches of two planes that are in use, *i.e.*, two active planes, one plane cannot be said to be redundant to the other (active) plane. Therefore, Cantwell does not teach or suggest autonomously switching from the non-operational element or link between the elements to an associated redundant element or link between the elements. Barker does not overcome the



deficiencies of Cantwell. As such, claim 1 is believed to be allowable over the cited art for at least these additional reasons.

It is noted that autonomously switching from a non-operational active element to an associated redundant element includes switching from an active control unit to a redundant control unit, as well as switching from a non-operational active cross-connect unit to a redundant cross-connect unit, when appropriate. No combination of the cited art appears to teach such limitations. The Examiner argues that this limitation is not claimed. It is noted that claim 1 recites active and redundant control units, as well active and redundant cross-connect units. As such, claim 1 is believed to be allowable over the cited art for at least this reason as well.

Claims 3-5, 9, and 22-24 each depend either directly or indirectly from claim 1 and are, therefore, each believed to be allowable over the cited art for at least the reasons set forth above with respect to claim 1. Each of these dependent claims recites additional limitations which, when considered in light of claim 1, are believed to further distinguish the claimed invention over the cited art. By way of example, claim 5 recites recording data related to each element in a database. The Examiner has acknowledged on page 14 of the Office Action dated December 28, 2005 that Cantwell and Barker fail to teach of recording data related to each card in a database. However, the Examiner argues that Harris overcomes this deficiency of Cantwell and Barker. The Applicant respectfully disagrees. It is respectfully submitted that in the passage of Harris cited by the Examiner, Harris discloses maintaining a database of all active fault alarms (Harris, column 4 at lines 11-12). A database of all active fault alarms does not suggest recording data related to each element in a database. As recited in claim 1, elements include control units, interface cards, and cross-connect units. Not all of these elements may have a fault alarm, and without a fault alarm, the database of Harris would not record an active fault alarm. Unless an element has a fault alarm, data associated with that element would not be recorded in the database of Harris. Hence, as the database of Harris would not record data related to each element in a database, it is submitted that claim 5 is allowable over the cited art for at least this additional reason as well.

Independent claims 10, 20, and 21 recite similar limitations as recited in claim 1, and are therefore believed to be allowable over the art of record for at least the reasons set forth above with respect to claim 1. Claims 12-14 and 18 each depend either directly or indirectly from independent claim 10 and are each also believed to be allowable over the art of record for at least the reasons set forth above.

2. *Independent claims 6 and 15 and their respective dependents*

Claims 6 and 15 each recite a limitation of monitoring the operational status for each one of a plurality of elements and for each communications link of a plurality of communications links between the plurality of elements. Further, claims 6 and 15 recite determining when the operational status of any of the plurality of elements or communications links indicates that the element or the communications link between the plurality of elements is non-operational, and of autonomously switching from the non-operational active element or link to an associated redundant element or link, respectively, when non-operational status is determined.

The Examiner argues that Cantwell discloses autonomously switching from the non-operational active element or link to an associated redundant element or link, respectively, when non-operational status is determined. As noted above with respect to claim 1, the Examiner cites lines 41-46 of column 16 of Cantwell, as well as lines 45-48 of column 17 of Cantwell as teaching of this limitation. Lines 41-46 of column 16 of Cantwell read as follows:

“Plane selection is controlled by system administration, but automatic switching capability is supported by the network interface card 100 firmware in case the selected plane fails.”

Lines 45-48 of column 17 of Cantwell read as follows:

“Monitor and selection circuitry provides failure detection and timing plane switching capability.”

These passages appear to disclose, at best, that when one plane fails, an automatic switching capability allows another plane to be selected. A plane such as a matrix plane or a timing plane is not taught as being an element or a link included in a flexible cross-connect system. In addition, Cantwell appears to teach away from one plane being redundant, as Cantwell discloses at lines 39-42 of column 16 that data is accepted from **both** matrix planes, and that both planes are monitored for valid parity and path ID. Both planes are in use, and when one of the planes in use that converts a network signal fails, a switch is made to the other plane that is in use (Cantwell, column 16 at lines 42-46). As Cantwell teaches of two planes that are in use, *i.e.*, two active planes, it is respectfully submitted that one plane cannot be said to be redundant to the other (active) plane. Therefore, Cantwell does not teach or suggest autonomously switching from the non-operational element or link between the elements to an associated redundant element or link between the elements. Barker does not overcome this deficiency of Cantwell. As such, claims 6 and 15 are each believed to be allowable over the cited art for at least this reason.

The Examiner has acknowledged, on page 10 of the Office Action dated December 28, 2005, that Cantwell does not disclose detecting and reporting when any element or communications link between a plurality of elements has a change in operational status. However, the Examiner has argued that Barker discloses such a limitation. It is noted that in the passages cited by the Examiner, Barker appears to disclose attribute polling, though Barker does mention displaying stage changes at lines 24-25 of column 28. It is respectfully submitted that the operational status of an element or a link does not appear to correspond to an attribute change. Attribute values, as disclosed by Barker, are object attributes, configuration attributes, audit attributes, polled attributes, and internal attributes (Barker, columns 23-24). An example of a polled attribute, for which a current value is only maintained if a client has registered for notifications of changes, is a system up time attribute (Barker, column 24 at lines 35-40). There is no indication that an operational status is an attribute, and the Applicant submits that an operational status is not a polled attribute.

Further, claims 6 and 15 recite determining **when** the operational status of any of a plurality of elements or communications links indicates that the card or the communications link

between the plurality of elements is non-operational. Though the Applicant does not believe that a polled attribute is equivalent to an operational status, for the sake of argument, it is noted that as polled attributes are polled at regular intervals of 15 seconds, polling attributes would not provide an indication of when an operational status indicates that a card or a link is non-operational. Therefore, claims 6 and 15 are also believed to be allowable over the cited art for at least these reasons as well.

Claims 7 and 8 each depend from claim 6, while claims 16 and 17 each depend from claim 15. Therefore, each of these dependent claims is believed to be allowable over the cited art for at least the reasons set forth with respect to claims 6 and 15. Each of these dependent claims recites additional limitations which, when considered in light of claims 6 and 15, are believed to further distinguish the claimed invention over the cited art.

### *3. Independent claim 19*

Independent claim 19 recites a method which includes monitoring the operational status for each one of a plurality of elements and each communications link between a plurality of elements, and determining when a non-operational active element or a non-operational active communications link between a plurality of elements requires maintenance. As discussed above with respect to claim 1, Cantwell does not teach of autonomously switching from a non-operational active element or link to an associated redundant element or link when the operational status of the element or links is determined to be non-operational. Therefore, claim 19 is believed to be allowable over Cantwell for at least this reason.

Claim 19 also recites determining when a non-operational element or a non-operational communications link between a plurality of elements requires maintenance. The Examiner has argued on page 7 of the Office Action dated December 28, 2005 that Cantwell teaches this limitation. It is respectfully submitted that the passages cited by the Examiner only disclose that a spare card is provided in the event that maintenance is needed on a primary card (Cantwell, column 9 at lines 30-32 and column 6 at line 28), and that a circuit or a connection can remain in

service while maintenance is performed on a network interface card (Cantwell, column 2 at lines 42-49). Cantwell fails to teach determining when a non-operational element or a non-operational communications link requires maintenance. At best, Cantwell discloses that maintenance may be performed on a card. There is no teaching of determining **when or if** maintenance is required. Accordingly, claim 19 is also believed to be allowable over the cited art for at least this additional reason.

The Examiner has acknowledged, on page 16 of the Office Action dated December 28, 2005, that Cantwell does not disclose reporting that maintenance is required for non-operational elements or links, or of maintaining a connection map associated with a network that a flexible cross-connect is a part of. However, the Examiner has argued that Read and Badt overcome these deficiencies of claim 19. By way of example, the Examiner has argued that Badt teaches of maintaining a connection map arranged to indicate statuses of nodes with a network, and of updating the connection map to indicate a change in status of a flexible cross-connect system. The Applicant respectfully disagrees with the Examiner. Badt discloses one map, stored in a database, that identifies sender nodes, chooser nodes, and addresses (Badt, paragraph [174]). There is no teaching or suggestion that this map includes anything but sender nodes, chooser nodes, and addresses. Further, Badt fails to teach that anything in this map is updated to indicate a change in status of any sort. Badt also discloses a map of spare capacity that is sent when a failure occurs (Badt, paragraph [179]), and a map of available spare links that is updated [185]). A map of spare capacity and a map of available spare links are not the same as a map that identifies sender nodes, chooser nodes, and addresses. It is submitted that Badt does not teach of or reasonably a connection map that indicate statuses of nodes within a network, and that is updated to indicate a change of status of a flexible cross-connect system. Badt teaches of an apparently static map of nodes, and a map of spare capacity that is updated. However, the map of spare capacity does not appear to indicate statuses of nodes. Read does not overcome the deficiencies of Badt. Therefore, claim 19 is also believed to be allowable over the cited art for this additional reason as well.

## Conclusion

For at least the foregoing reasons, the Applicant believes all claims now pending in this application are in condition for allowance and should be passed to issue. If the Examiner believes a telephone conference would in any way expedite prosecution of the application, please do not hesitate to contact the undersigned at (408) 868-4096.

Respectfully submitted,

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